seconds as against an average of forty-eight seconds with the bare fingers. A marked improvement in the tactile sense is brought about by the use of carefully fitted gloves as shown in the second series where, by care in fitting, the average was reduced from seventy to sixty-six seconds. Gloves put on wet give the most favorable opportunity for exercising the sense of touch and gloves put on dry the least favorable.

THERAPEUTICS

UNDER THE CHARGE OF

SAMUEL W. LAMBERT, M.D.,

PROFESSOR OF CLINICAL MEDICINE IN THE COLLEGE OF PHYSICIANS AND SURGEONS, COLUMBIA UNIVERSITY, NEW YORK.

On the Toxicity of Various Commercial Preparations of Emetin Hydrochlorid.—LEVY and ROWNTREE (*Arch. Int. Med.*, 1916, xvii, 420) introduce their article by stating that in view of the widespread use of emetin hydrochlorid for the treatment of amebic dysentery and of pyorrhea alveolaris, more precise knowledge of the toxicity of the commercial preparations employed is highly desirable. They describe two cases of poisoning with a fatal result in one of these cases. The fatal result occurred in a man who received, daily, subcutaneous injections of emetin hydrochlorid over a period of twenty days for the treatment of amebic dysentery. The average daily dose was 1.5 grains; the total amount he received was 29 grains. A previously existing diarrhea was at first apparently somewhat ameliorated then markedly intensified. The diarrhea stopped five days after withholding the emetin. On the sixteenth day of treatment the patient complained of nausea and abdominal pain and signs of acute renal insufficiency began to develop. The evidences of kidney involvement increased rapidly, with blood in the urine and diminution in the phenolphthalein output along with an increase in the non-protein nitrogen of the blood. The patient finally developed bronchopneumonia and died with symptoms of vasomotor collapse. The other patient who developed toxic symptoms was an undernourished woman who received four subcutaneous injections of 0.5 grain of the drug at daily intervals for the treatment of pyorrhea alveolaris. An intense diarrhea developed, associated with abdominal pain and tenesmus, which ceased six days after discontinuing the emetin treatment. At the same time she was in a toxic delirious state, which lasted for one week. These symptoms were quite out of proportion to the moderate dosage employed, and the particular preparation was suspected of being unusually toxic. This suspicion was apparently confirmed by the severe toxic symptoms with fatal result that followed the injection of corresponding doses of this same preparation in animals. The authors then proceeded to investigate the toxicity of five commercial preparations of emetin hydrochlorid, in the course of which investigation sixty-two animals were used. They found that the toxic symptoms vary considerably but the principal toxic effects observed were vomiting, diarrhea, marked albuminuria, muscular weakness, development of cardiac irregularity. The authors also cite a number of reported cases of poisoning in which the chief clinical manifestations were marked diarrhea, and peripheral neuritis. The case reported by them is the first fatal case so far in the literature. It is also important to note that toxic symptoms may develop after the administration of emetin has been discontinued. Since the most frequent toxic symptom is diarrhea, it is necessary to warn against further emetin treatment upon the recurrence of dysenteric symptoms in every case of amebic dysentery. The authors offer the following suggestions with regard to a rational emetin therapy. Individualization by close clinical observation is essential both for the success and safety of the treatment. Patients may differ markedly in their susceptibility to the drug, and the various commercial preparations vary widely in toxicity. The treatment should be given in courses, at intervals of several days or a week. The subcutaneous route is the one of choice. Individual dosage and the duration of each course must be determined by the exigencies of the case. One-third grain three times a day for a week or ten days is usually a safe dosage in amebic infections. It is rarely necessary to give more than 1.5 grains daily. In the treatment of pyorrhea, Bass and Johns advocate 0.5 grain daily for from three to six days, and maintain that no case need have more than six days' treatment. Under ordinary circumstances this seems well within the margin of safety. It must be borne in mind, however, that the administration of even relatively small doses over a long period of time may prove harmful. The large dosage advocated by Baermann and Heinemann is unnecessary and dangerous. Intravenous injections should be employed only in extreme cases. If this mode of administration seems imperative, small doses well diluted (0.5 grain in 100 c.c. salt solution) should be slowly given, and the blood-pressure should be carefully observed during the injection.

Diarsenol versus Salvarsan.—Gardner (*Jour. Am. Med. Assn.*, 1916, lxvi, 1303) writes concerning diarsinol which is a substitute for salvarsan manufactured in Canada. The literature on this new preparation is meager, but apparently it differs only slightly from salvarsan. Gardner has given over 300 doses of diarsenol, employing the same technic as in the case of salvarsan. Only three patients have experienced any reaction. He gives it intravenously by the syringe method in concentrated solution. The average patient receives from ten to fifteen doses, depending on the stage of the disease and on the strength of the Wassermann reaction. These doses are given every other day, beginning with a half-dose and increasing the dosage so that the third is a full one of 0.6 gm. By this method, the author believes that he has obtained much better results than by giving the remedy at intervals of one week, two weeks or a month. Gardner believes that the clinical results and the diminution in the positive Wassermann in patients treated with diarsenol compare very favorably with the results obtained by salvarsan therapy. He found that both salvarsan and diarsenol are more liable to be followed by nausea and shock than neosalvarsan.

In the administration of diarsenol the author noted that some solutions remained a light color while others became dark almost immediately. He attributes the change in color to oxidation of the solution and the solutions which oxidized rapidly seemed to be those which usually caused the reactions.

Emetin in the Treatment of Amebic Abscess of the Liver.—Dopter (*Paris Médicale,* 1916, vi, 243) again calls attention to the beneficial effects of emetin in treating amebic abscess of the liver. His experience now consists of twelve cases and while he is convinced that emetin is of great value in its effect in destroying amebæ, he does not advocate the emetin method alone for the treatment of amebic abscess of the liver but urges its combination with the proper surgical procedures.

The Spleen.—Mayo (*Jour. Am. Med. Assn.,* 1916, lxvi, 716) reviews briefly the present status regarding the knowledge of the functions of the spleen. He speaks especially of the effects of splenectomy in diseases for which this operation has been recommended during the past few years. Patients with anemias associated with enlargements of the spleen are cured or greatly benefited by splenectomy. The syndrome called splenic anemia, the terminal stage of which is known as Banti's disease, may be cured by removal of the spleen in a high percentage of cases. In the later stages, after ascites has developed, and the liver has become cirrhosed, but little may be expected from the removal of the spleen and yet Mayo has seen several patients in this terminal condition cured by splenectomy. Splenic anemia with adult characteristics is not infrequently seen in childhood, and is promptly relieved by splenectomy. Mayo says it is quite probable that the pseudoleukemic anemia of von Jaksch is merely the infantile type of splenic anemia, the increased leukocytes being merely a difference in the reaction of the blood due to infancy. With the splenic anemias may be classified Goucher's disease. His experience in three cases of this disease has shown that in the earlier stages the condition is cured by splenectomy. One of the most interesting anemias of splenic origin is the so-called hemolytic jaundice, a disease of the young, accompanied by acholuric jaundice, that is, there is no evidence of biliary obstruction, bile is present in the stools and there is no itching. There are two types of this disease, one the familiar type of Minkowski which often affects several members of the same family and is less severe in its manifestations, many patients living out a life expectancy. The other is the acquired type of Hayem and Widal which comes on during puberty or adolescence and usually ends in death. In hemolytic jaundice the patient suffers from crises accompanied by tenderness over the liver and spleen, an increase of temperature and quickness of pulse. Based on an experience of nine splenectomies for hemolytic jaundice the author states that no other operation gives more brilliant and striking results. Within twenty-four hours the jaundice begins to disappear, and in a few days the patients perhaps for the first time have clear complexions; the anemia is rapidly overcome and they remain well. Eppinger first called attention to the remarkable improvement of the patient after removal of the spleen in pernicious anemia. Although sufficient time has not elapsed to say that these patients are permanently cured no other means of therapy has so promptly brought about an improvement in the condition of the patient, and so definitely relieved the anemia. It is true that in the late stages when there are spinal cord changes these changes do not disappear, although the condition is marvelously improved, nor do all the characteristic cells of pernicious anemia disappear from the blood. Judging from the effects observed in nineteen patients Mayo feels justified in performing splenectomy in selected cases of pernicious anemia, and has at least the hope that if it is done sufficiently early in the course of the disease, it will permanently check if not cure the condition.

The Springs at Saratoga: Their Value in the Treatment of Disease.—THOMPSON (*Med. Record*, 1916, lxxxix, 589) calls attention to the great therapeutic possibilities of the springs at Saratoga comparing them with well-known spas in Europe. Now that the springs have come into state control much is to be hoped for in increasing their therapeutic possibilities, for it is indeed the method of state and municipal control which has placed the principal European spas upon their high plane of efficiency. So far as chemical composition of the waters is concerned the springs at Saratoga are similar and often superior to corresponding European Springs. The many different springs of Saratoga which may be drunk fall naturally into three general groups, in each of which a half dozen or more of the most active and copious springs are included. These are: (1) the saline laxative group typified by the long-familiar Hathorn and Congress waters; (2) the alkaline saline group, typified by the geyser spring, in the waters of which alkalinity is the essential feature, together with medicinal quantities of iron and lithium, and (3) the alkaline, iron or chalybeate springs, typified by the karista, which yields a strong excess of ferrous carbonate. All of these waters are copiously charged with natural carbonic acid gas, which renders them more palatable and efficient, and in such of them as are used for bathing, excites distinct cutaneous reaction. With the exception of sulphur the waters at Saratoga contain all of the important mineral or inorganic chemical ingredients of the body, and their drinking affords opportunity for the replacement of these ingredients, as well as for added solvent, diuretic and evacuant effects. The saline laxative or aperient waters of the Congress and Hathorn No. 1 springs are those upon which the more than national reputation of Saratoga Springs was first built. Their laxative effect is due to a high percentage of bicarbonate of magnesia, together with sodium sulphate and other salts. They are useful in cases of chronic constipation, hepatic congestion, cirrhosis, chronic arthritis, arteriosclerosis with high tension, obesity, gout, diabetes, and similar disorders of metabolism. The second group are antacid and are beneficial in gastric hyperacidity, rheumatism, gout, lithemia, gravel, neuritis, etc. These waters resemble French vichy closely. The third group are valuable in cases of chronic anemia and retarded convalescence. Thompson says in comparing the Saratoga waters with those of foreign spas, no claim can be made for them as a "cure-all," but it is proved that the number and variety of the springs is exceptional, that the supply of waters for both drinking and bathing is now abundant, the climate and surroundings are in every way attractive and the resort is most accessible. They should be tried by invalids who have heretofore visited foreign spas and in properly selected cases results may ultimately be obtained fully comparable to those of the most successful foreign resorts.

The Results from Blood Transfusion in the Treatment of Severe Posthemorrhagic Anemia and the Hemorrhagic Diseases.—PETERSON (*Jour. Am. Med. Assn.*, 1916, lxvi, 1291) says that the transfusion of blood, intramuscular injections of whole blood, and intravenous and subcutaneous injections of homologous serum are the most efficient measures, and are of value in the order named in the treatment of hemorrhage and the hemorrhagic diseases. In severe cases of acute posthemorrhagic anemia, blood transfusion is the best, and at times the only efficient means to save life. In chronic posthemorrhagic anemia, provided the cause of the bleeding is removed or remedied, no other means will compare in efficacy with transfusion of blood to stimulate the blood-forming organs. Transfusion of blood has on numerous occasions proved effective in pathological hemorrhages after the failure of all other measures. In some cases, when the blood of one donor has proved ineffectual, the use of blood from another donor has brought about striking results. From a practical point of view, the best clinical results have been obtained in hemorrhagic disease, when a young healthy donor, not fully matured, could be secured. Since there is no method of standardizing blood as a therapeutic agent, variable results must be expected. When properly safeguarded by preliminary tests, the procedure is attended with a majority of favorable results and comparatively few failures.

Vaccine Treatment.—HEKTOEN (*Jour. Am. Med. Assn.*, 1916, lxvi, 1591), in the summary of his article, states that it may be concluded that the general results so far from the routine use of commercial vaccines, polyvalent and mixed, have no value as evidence for or against the curative usefulness of vaccine treatment, and hence no value, either with respect to the soundness of the theory on which vaccine treatment primarily has been developed. In subacute and chronic localized infections, the results appear to indicate that specific vaccines properly and skilfully used have value, quite likely because they increase the production of specific antidobies, as demanded by the theory, but probably also because they stimulate leukocytic and other activities. In typhoid fever and possibly also in other infectious diseases, the intravenous injection of specific vaccines and also of other substances may induce crisis and prompt recovery. The mechanism of this action is not fully understood; but as it involves something more than or different from specific stimulation of the production of antibodies, it cannot be interpreted in terms of the current conception of the action of vaccines.

The Excretion of Salvarsan after Intravenous Injections of Concentrated Solutions.—STERN—*Deutsch. med. Wchnschr.*, 1916, xlii, 416) has determined from his observations in a large number of cases that the excretion of salvarsan following the injection of the drug in concentrated solution is much slower than when it is given in large quantities of a more dilute solution. This fact makes him conclude that the injection of concentrated solutions of salvarsan is of greater therapeutic effect because of the presence of the remedy in the blood and body fluids for a longer period of time. The use of concentrated solutions for intravenous injection is far more practical because of the greater simplicity of technic of administration, less apparatus required for the injections and no assistant necessary, etc. The method of giving salvarsan in concentrated solution is especially applicable to the newer modifications of salvarsan—neosalvarsan and sodium salvarsan.

The Vitamine Solution of the Pellagra Problem.—WOOD (*Jour. Am. Med. Assn.*, 1916, lxvi, 1447) says that there is no doubt in the minds of a large number of the students of pellagra that the deficiency theory of Goldberger is correct. Wood says that up to recent years in the South especially, corn was simply crushed between two stones and the only thing removed was the coarse particles of outer skin or husk. This method of milling has largely been replaced by steam or electric milling. By this process the corn is subjected to heat in order to loosen the outer coarse husk. This element, the degree of heat used, may be an important factor in destroying vitamines since they are killed at 120° C. After the heating process the grain is passed into a "degerminator" which removes the germ. This is done because the germ contains such a large amount of fat that rancidity would soon occur if it were left in the meal. Besides this the germ would give to the meal a yellow color which by modern standards is considered undesirable. The offal, which contains the germ, husks, and bran, some flour and flinty portion of the grain, constitutes about 30 per cent. of the entire weight of the grain. This is known as "corn chops" and is fed to cattle. The remaining endosperm is finely ground and the product is known as granulated cornmeal. Wood believes not only that pellagra is a deficiency disease but that the deficiency can be definitely attributed to the modern method of corn milling. Deterioration of corn may also be productive of pellagra because the germ is the portion of the grain most subject to the action of molds and animal parasites. Wood has noted that pellagra is practically unknown in sections of the South where, because of inaccessibility to railroads, the inhabitants still use the old-fashioned ground whole meal.

The Influence of Salicylates on Metabolism in Man.—DENIS and MEANS (*Jour. of Pharm. and Exper. Therap.*, 1916, viii, 213) report results which show in the case of two normal men that the administration of large doses of sodium salicylate (up to 6.6 grams per day) produces an increase in the excretion of nitrogen, phosphates, and uric acid. In one case, this increased nitrogenous metabolism was accompanied by an increase in the basal metabolism and symptoms of salicylate intoxication. In the other case and in one mildly septic case, a much greater increase in the urinary excretion of nitrogen which extended throughout the after period was observed but there was no increase in the basal metabolism and no symptoms of intoxication occurred. No change in the respiratory quotient occurred in any of these subjects.